

CLAIMS

1. A water treatment and pressurization system for the adiabatic cooling of comburent air destined for plants using gas turbines (15), run by measuring, control and regulation units, comprising a lifting and pressurizing station (16) of vaporization water at a varying flow-rate for a maximum operating pressure, preferably up to 120 bar, associated with a series of nozzles (20) situated on nozzle-holder ramps (12) downstream of which there is at least one housing unit (44) for humidity and temperature probes (52-55).

2. The water treatment and pressurization system according to claim 1, characterized in that said system is installed and/or integrated in both newly constructed and installed and also in already existing auxiliary plants for gas turbines.

3. The water treatment and pressurization system according to claim 1, characterized in that said lifting and pressurizing station (16) has, as pumping unit, one or more pumps (22), each equipped with a continuous electric-electronic inverter (38, 38a) of the rotation rate, automatically run, operated by an automatic measurement, regulation and control system (41, 42).

4. The treatment and pressurization system according to claim 1, characterized in that said housing unit (44)

comprises a chamber (51) which houses measuring and control units, wherein said chamber (51) is positioned horizontally or vertically in a transit canalization or duct (14) of comburent air, said chamber (51) being associated  
5 with concentric container elements (45, 48), both equipped with a number of holes (47, 50), arranged in an out-of-axis sequence with suitable dimensions for the passage of comburent air, wherein the external container element (45) is fixed and the internal container element  
10 (48) rotates on its own axis.

5. The treatment and pressurization system according to claim 4, characterized in that the moveable container element (48) is equipped with an engine (49), coupled with a rotation regime reducer, whose function is to allow  
15 a sequential flow of comburent air to the measuring units.

6. The treatment and pressurization system according to claim 4 or 5, characterized in that the fixed container element (45) is associated with one or more measuring  
20 units (52-55), situated at its end, as well as with a fan (56), positioned downstream of said measuring units, for the suction of the sample of comburent air.

7. The treatment and pressurization system according to claim 4, characterized in that the moveable container  
25 equipped with an engine (49), coupled with a rotation re-

- gime reducer, is run by a software that reveals the position by means of an encoder system and through a programmed logic, decides and memorizes the appropriate position for registering the thermo-hygrometric conditions.
- 5 8. The water treatment and pressurization system according to claim 1, characterized in that said lifting and pressurizing station (16) is equipped with vaporization water conditioning apparatuses, with the possible fractionation in several filtration and separation steps
- 10 of the slurries, using components with a mechanical and/or electromagnetic action, subjected to both manual and automatic control with local and/or remote installation with local and/or remote analogical visualization of the process data.
- 15 9. The water treatment and pressurization system according to claim 1, characterized in that said lifting and pressurizing station (16) is equipped with at least one pair of parallel pumps (22) each provided with a series of components which, on the suction side of the pump
- 20 (22), consist of a manual interception valve (26) for the exclusion of the water feeding, an electromagnetic valve (27) of the on/off type, upstream of a filter (28) and a minimum pressure manostat (29), and a manometer (30) for the analogical reading of the feeding pressure, and on
- 25 the pressing side of the pump (22) there is a manometer

(32) for controlling the pressurization state, together with a pre-calibrated safety valve (33) for the protection of the maximum allowable operating pressure plant, a hydraulic accumulator (34) for compensating the pressure differences, a three-way by-pass valve (35), calibrated at the maximum operating value, a three-way valve (36), inserted downstream and in sequence with the previous by-pass valve (35), a maximum/minimum pressure manostat (37), and also flexible connections (31) to the water conveyor duct and each pump (22) to ramp-holder collectors (39).

10. The water treatment and pressurization system according to claim 1, characterized in that the quantity of water sent to the nozzles and vaporized thereby can continuously vary, according to the necessities of the measuring, regulation and control units envisaged in the present cooling system.

11. The treatment and pressurization system according to claim 1, characterized in that said housing unit (144) comprises a chamber (151) which houses measuring and control units (52-55), wherein said chamber (151) consists of side panels (57, 58, 59 and 60) and end plates (61 and 62), a front plate (61) equipped with holes (70a) associated with holes (70b) situated in a fixed plate (71) positioned inside the chamber (151), in which said holes

(70a) are connected by means of flexible tubes (72) to the duct (14) from which air samples are removed in different points of the duct section, there also being a rotating disk (73), equipped with at least one hole (70c) which alternatively connects at least one of said flexible tubes (72) to the chamber (151) and the duct (14).

12. The treatment and pressurization system according to claim 11, characterized in that it also comprises an equalizer panel (64) positioned in correspondence with the arrangement of outgoing tubes from the humidity and temperature probes (52, 53, 54 and 55).

13. The treatment and pressurization system according to claim 12, characterized in that it also envisages, downstream of said equalizer panel (64), a perforated sheet (63) which acts as an equalizer panel before the connection to a suction fan (56) and re-conveying of the comburent air samples in a duct (14) downstream of said humidity and temperature probes (52-55).

20

25